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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/887,481	06/22/2001	Harri Posti	930.332USW1	7569
32294	7590	11/17/2003	EXAMINER	
SQUIRE, SANDERS & DEMPSEY L.L.P. 14TH FLOOR 8000 TOWERS CRESCENT TYSONS CORNER, VA 22182			PHU, PHUONG M	
		ART UNIT		PAPER NUMBER
		2631		12

DATE MAILED: 11/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/887,481	POSTI, HARRI	
	Examiner Phuong Phu	Art Unit 2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 26 August 2003.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 23-38 and 40-49 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 23-38 and 40-49 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.
- 13) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 - a) The translation of the foreign language provisional application has been received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|--|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is responsive to the Amendment filed on 8/26/03.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 23-38 and 40-49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Limitations “said plurality of digital signals” (line 11 of claim 23, line 10 of claim 47, line 12 of claim 48, and line 10 of claim 49); “said input signals” (line 17 of claims 23, line 16 of claim 45, line 14 of claim 46, line 14 of claim 14, lines 15-16 of claim 48, and line 14 of claim 49), “the composite signal” (line 3 of claim 25, and line 2 of claims 28 and 33), “the different signals” (line 7 of claim 44), “said different signals” (line 16 of claim 44, lines 3 and 13 of claim 45, line 3 of claim 46, lines 2-3 of claim 47, lines 2-3 of claim 48, and lines 2-3 of claim 49) are lack of antecedent basis.

In claim 23, the limitation “amplification of the composite **digital** signal by said amplifier means” on line 13 should be changed to “amplification of the composite **analog** signal by said amplifier means” in order to be consistent with limitation “amplifier means for receiving and amplifying said composite analog signal” on lines 9-10.

Claims (if any, depended on above claims) are therefore, also rejected.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 23-25, 28-31, 33, 37, 38, 40, 42-45, 47 and 48 are rejected under 35 U.S.C. 102(b) as being anticipated by Carney et al (5,937,011), prior art of record.

As per claims 23, 44, 45, 47 and 48, see figure 1 and col. 2, line 20 to col. 4, line 17, Carney et al discloses a method and associated system comprising:

input step/means (inherently included) for receiving a plurality of different digital signals (121-1,..., 121-n);
modulator step/means (120) for modulating said different digital signals at respective carrier frequencies;

combiner step/means (122) for combining said plurality of different digital signals to provide a composite digital signal (15);

D/A converting step/means (160) for converting said composite signal into a composite analog signal;

amplifier step/means (including (18)) for receiving and amplifying said composite analog signal;

predistortion step/means (14) for predistorting said plurality of different digital signals wherein the predistortion performed by step/means (14) is performed after the modulator step/means and prior to the amplifier step/means, and dependent on a difference between input signals in a signal (125) (which comprises a version of said different digital signals) and the output of said amplifier step/means.

As per claim 24, Carney et al discloses that said input step/means separately receives each of said different digital signals (see figure 1).

As per claim 25, Carney et al discloses a combiner means (122) to provide a composite digital signal (see figure 1).

As per claim 28, Carney et al discloses that said predistortion step/means predistorts the composite digital signal (see figure 1).

As per claim 29, Carney et al discloses a feedback path (165, 166) (see figure 1).

As per claims 30 and 33, Carney et al discloses that the distortion step/means compares the output from the amplifier step/means for the feedback path with the signals received by the input step/means and provides predistortion values applied to a subsequent signal received by the input step/means (see figures 1 and 2A, and col. 4, lines 18-52).

As per claim 31, Carney et al discloses means (23, 165, 166) for separating the output of the amplifier step/means into a signal (150) comprising a plurality of different digital signals.

As per claim 37, Carney et al discloses that the amplifier step/means comprises an amplifier (18).

As per claim 38, Carney et al discloses that said predistortion step/means compensates for the nonlinearity of amplitude of the amplifier (see col. 4, line 49-52).

As per claim 40, Carney et al discloses an A/D converter step/means (166) as claimed (see figure 1).

As per claims 42 and 43, Carney et al discloses a station comprising the method and associated system (see col. 2, line 20-35).

6. Claims 23-27, 29-38 and 40-49 are rejected under 35 U.S.C. 102(e) as being anticipated by Helms (2001/0014592), prior art of record.

As per claims 23 and 44-49, see figure 4 and page 2, section [0028] to page 3, section [0035], Helms discloses a method and associated system comprising:

input receiving and modulating step/means (inherently included) for receiving a plurality of different digital signals and modulating said different digital signals at respective carrier frequencies in order to produce and provide a plurality of different carrier modulated signals (in₁, ..., in_n) at the input of means (PDD) (see page 2, [0028]);

combiner step/means (DUC, SUM) for combining said plurality of different carrier modulated signals to provide a composite digital signal (in_p);

D/A converting step/means (DAC) for converting said composite digital signal into a composite analog signal;

amplifier step/means (UM, PA) for receiving and amplifying said composite analog signal;

predistortion step/means (PDD) for predistorting said plurality of different carrier modulated signals wherein the predistortion performed by step/means (PDD) is performed after the modulator step/means and prior to the amplifier step/means, and dependent on the difference between said different carrier modulated signals (in_1, \dots, in_2) (which comprises a version of said different digital signals) and the output (out_m) of said amplifier step/means.

Further regarding to claims 46 and 49, Helms further discloses an A/D converter step/means (DM, ADC) for converting the output of the amplifier step/means into a composite digital signal comprising a plurality of digital signals outputted from means (ADC); and a channelizing step/means (DDC) for converting said composite digital signal into a plurality of different digital signals (see figure 4).

As per claim 24, in Helms, said receiving and modulating input step/means inherently separately receives each of said different digital signals in order to perform a modulation with each of them with a corresponding carrier in order to provide separate carrier modulated signals (in_1, \dots, in_n) at the input of means (PDD) (see figure 4).

As per claim 25, Helms discloses a combiner means (DUC, SUM) to provide a composite digital signal (see figure 4).

As per claim 26, Helms discloses said distortion step/means, using means (PD_1, \dots, PD_n), predistorts individually said each of said plurality of different carrier modulated signals (see figure 4).

As per claim 27, Helms discloses said distortion step/means predistorts said plurality of different carrier modulated signals before being combined in said combiner step/means (see figure 4).

As per claim 29, Helms discloses a feedback path (DDC, ADC, DM) (see figure 4).

As per claims 30 and 33, Helms discloses that the distortion step/means compares the output from the amplifier step/means for the feedback path with the signals received by the input receiving and modulating step/means and provides predistortion values applied to a subsequent signal received by the input receiving and modulating step/means (see figure 4 and page 2, section [0029] to page 3, section [0033]).

As per claim 31, Helms discloses means (AK, DM, ADC) for separating the output of the amplifier step/means into a signal comprising a plurality of different digital signals (outm₁,...,outm_n) (see figure 4).

As per claim 32, Helms discloses that said predistortion step/means compares each of said separated signals with the corresponding signal received from said input receiving and modulating step/means to determine predistortion values to be altered (see figure 4 and page 2, section [0029] to page 3, section [0033]).

As per claim 34, Helms discloses that said predistortion step/means provides a plurality of predistortion values stored in means (LUT), each provided for the respective carrier frequency (see figure 4).

As per claim 35, Helms discloses that each of said predistortion values corresponding to a respective carrier frequency takes into account characteristics of other carrier frequencies (see page 1, section [0009]).

As per claim 36, Helms discloses that said characteristics comprise frequency and distortion (see page 1, section [0009]).

As per claim 37, Helms discloses that the amplifier step/means comprises an amplifier (PA).

As per claim 38, Helms discloses that said predistortion step/means compensates for the nonlinearity of amplitude of the amplifier (see page 1, section [0009]).

As per claims 40 and 41, Helms discloses an A/D converter step/means (ADC) as claimed (see figure 4).

As per claims 42 and 43, Helms discloses a station comprising the method and associated system (see pages 2, section [0024]).

Response to Arguments

7. Applicant's arguments in REMARKS of the Amendment filed on 8/26/03 have been fully considered but they are not, in part, persuasive.

Applicant's arguments with respect to the objections on the drawings and specification are render moot since the drawings and specification have been amended to overcome the objections. The objections are now withdrawn.

Applicant's arguments with respect to the rejection, under 35 USC, second paragraph, to claims 23-44 have been considered. However, the claims after being amended, are still rejected, under 35 USC, second paragraph, with reasons as set forth above.

Applicant's arguments with respect to the rejection to claims 23-25, 28-31, 33, 37, 38, 40 and 42-44, as being anticipated by Carney et al, are not persuasive. The applicant mainly argues that (i) Carney et al method and associated system are different from the ones of the instant

Art Unit: 2631

application as disclosed in its disclosure, and (ii) Carney et al does not disclose a digital to analog converting means which converts a composite digital signal comprising a plurality of different digital signals at respective carrier frequency into a composite analog signal, as recited in claims 23 and 44. Regarding to part (i), the applicant is noted hereby that the rejections are based on the limitations given in claims, and not based on the disclosure of the instant application. The applicant is respectfully reminded that the specification is not a measure of the claimed invention. Therefore, the limitation contained in the specification cannot read into claims for the purpose of avoiding the prior art (In re Sporck, 155 USPQ 687). Regarding to part (ii), the examiner respectfully disagrees. See figure 1, Carney et al discloses a D/A converting step/means (160) for converting a composite digital signal (as a version comprising a plurality of digital signals outputted from means (120-1,..., 120-n) at respective carrier frequency) into a composite analog signal.

Applicant's arguments with respect to the rejection to claims 23-27, 29-39 and 40-44, as being anticipated by Helms, are not persuasive. The applicant mainly argues that Helms predistortion is performed before modulation (DUC) of input signals, not during or after modulation of these input signals, as claimed. The examiner respectfully disagrees. In Helms, means (DUC) in combination with means (SUM) is considered here as a combiner means for combining a plurality of different carrier modulated digital signals. Further, see figure 4, Helms discloses a predistortion step/means (PDD) for predistorting a plurality of signals (in1,..., in n) at the input of means (PDD). These plurality of signals are said different carrier modulated digital signals (see page 2, [0028]), which each inherently is formed by a modulation on a corresponding digital signal of a plurality of digital signals with a respect carrier. Furthermore,

In Helms, even though not shown in figure 4, Helms must include a modulation means being performed prior to the predistortion means (PDD) wherein the modulation means receives a plurality of digital signals and modulates said digital signals at respective carrier frequencies in order to produce and provide a plurality of said different carrier modulated digital signals (in1,..., in n) at the input of means predistortion (PDD). Based on that rationale, Helms does teach a predistortion being performed after a modulation as claimed.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuong Phu whose telephone number is 703-308-0158. The examiner can normally be reached on M-F (8:30-6:00) First Monday Off.

Art Unit: 2631

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 703-306-3034. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4700.

Phuong Phu
Primary Examiner
Art Unit 2631

Phuong Phu
Phuong Phu
11/07/03

**PHOUNG PHU
PRIMARY EXAMINER**